

PQ

Ultrasonic Discharge Measurement system



SOMMER's PQ is a self-contained continuous wave doppler flowmeter that offers industry standard performance coupled with robust build quality and reliability, all backed up by SOMMER's exceptional customer service and support mechanisms.

It incorporates all of the low noise electronics to drive propriety Digital Signal Processing techniques that provide measurements in both waste and clean water with flow rates as low as 0.01 ms^{-1} and up to 5 ms^{-1} . Even in very shallow water (0.15 to 0.20m) accuracies of better than 0.01 ms^{-1} can be achieved.

The level of integrity of flow measurement is calculated using two factors:

Flow Balance and Signal Level. The Flow Balance is an indication of how laminar the flow is, while the Signal Level is the spread of point measurements compared to the final calculated flow value over a period of observation. A quick, simple metric that gives confidence of the system's performance.

Calibration:

The PQ is calibrated in a purpose-built facility against multiple flow speeds to a traceable standard

Key Features:

- High accuracy velocity measurement even in very shallow water
- Low power consumption
- Bi-directional flow measurement
- Digital signal processing and filtering
- Velocity measurement: temperature and sound speed correction
- Integrated temperature

Operations:

Open Channel and Pipeline Flow Monitoring for

- Industrial & Treatment plants | Wastewater networks | Sewers | Canals | Rivers | Streams
- Trade Effluent & Discharge surveys - Diagnostics
- Flow check surveys
- Flood & CSO monitoring
- Stand-alone & Integrated solutions
- Permanent installation
- Temporary deployment

Sensor: Technical Specifications

The PQ measures the flow of water using the principle of Doppler shift. A signal of 1MHz is transmitted from a dedicated transmit transducer, the reflected signal is received at a dedicated receive transducer. The change in frequency is resolved using Digital Signal Processors (DSP) techniques and a flow speed determined.

The speed of sound in water, important for accurate doppler shift determination, can be a fixed value or constantly updated through temperature observation and a user defined conductivity value.

Operational Performance

Flow: Bi-Directional	from a minimum of 0.01 m/s to a maximum of 5.0 m/s
Accuracy	Steady, fully developed flow* Resolution Less than 0.5 m/s ±0.01 m/s Greater than 0.5 m/s ±2% with uniform velocity profile and known water conductivity Resolution 0.001 m/s *Field performance is site specific
Temperature Measurement	from a minimum of -10° C to a maximum of +85° C Accuracy ±0.5° C Resolution 0.5° C
Minimum water level	15mm to 20mm above the base of the sensor transducers to be fully wetted

Electrical

Power Supply	9 to 28 V DC
Power Consumption (at 12 V)	standby: 14mA operating: 25mA controller: 0.65 mA @ 12V
Lightning protection	Integrated protection against indirect lightning with a discharge capacity of 6 kA Ppp

Operational Characteristics

Temperature	Operational Resolution from a minimum of -20° C to a maximum of +60° C Storage Resolution from a minimum of -20° C to a maximum of +60° C
Immersion	Sensor IP68 Controller IP67
Modes	Single measurement Continuous measurement
Outputs	1x RS-485 (9600...115200 Baud), Modbus RTU 1x SDI-12 as secondary/slave (version 1.3) 4x Analog current output (with optional analog output board) 6x Switched output @ supply voltage (can be used as pulse output by adding a pull-down resistor)

Physical Characteristics

Power Supply	9 to 28 V DC
Size L x W x H	Sensor: L 122 x 46 x 19 mm (4.80 x 1.81 x 0.74 inch) Controller: L 180 x 150 x 90 mm (7.09 x 5.91 x 3.54 inch)
Weight	Sensor: 1.1 kg (2.43 lb) with 10m of cable Controller: 1.48 kg (3.26 lb)

Water level sensors available

Radar (with analog or digital interface)
Pressure (with analog or digital interface)
Bubbler (with analog or digital interface)